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BY OVERNIGHT DELIVERY

September 29, 1994

Mr. William F. Caton
Office of the Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, DC 20554

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Dear Mr. Caton:

On behalf of Hammett & Edison, Inc., Consulting Engineers, three copies are enclosed of our reply comments to Mass Media Docket 93-24, concerning the Commission's rules with regard to Instructional Television Fixed Service stations.

These reply comments are being filed two days past the September 28 deadline for reply comments due to illness on behalf of the engineer writing these comments. It is respectfully requested that these reply comments nevertheless be considered.

Sincerely yours,

DOCKET FILE COPY ORIGINAL

William F. Hammett

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Enclosures (3)

cc: Mr. Harry Perlow (1)
Mr. Philip M. Mustain (1)
Mr. Tony G. Thomson (1)
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**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)
)
Amendment of Part 74 of the)
Commission's Rules with Regard to)
the Instructional Television Fixed Service)
)

MM Docket 93-24

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To: The Commission

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Reply Comments of Hammett & Edison, Inc.

The firm of Hammett & Edison, Inc., Consulting Engineers, ("H&E") respectfully submits these reply comments to the above-captioned proceeding relating to the processing of Instructional Television Fixed Service (ITFS) applications. Hammett & Edison, Inc. is a professional service organization that has provided consultation since 1952 to commercial and governmental clients on communications, radio, television, and related engineering matters, including the design of ITFS, MDS, and MMDS stations.

I. No Revision of 28 dB D/U Ratio for Co-Channel Stations on Proper Offset

1. The Order and Further Notice of Proposed Rulemaking (O&FNPRM) to MM Docket 93-24, released July 6, 1994, requested, at Paragraph 24, comments on whether existing or mutually exclusive proposed ITFS stations should be required to employ a frequency offset, if the use of frequency offset would allow the granting of both applications. The O&FNPRM went on to explain that it was Commission policy to allow a desired-to-undesired (D/U) signal ratio of as low as 28 dB for stations employing the appropriate standard offsets.¹ Nowhere in the O&FNPRM was any suggestion made that the 17 dB relaxation in the D/U ratio, from 45 dB to 28 dB, now allowed for offset ITFS stations, was under review.
2. Nevertheless, the comments of at least three parties, Hardin and Associates, Inc. ("Hardin"), the Wireless Cable Association International, Inc. ("WCAI"), and the joint

¹ By "standard offset" we are referring to stations employing a $\pm 1,000$ Hz frequency tolerance and "plus," "zero," or "minus" 10,000 Hz offsets. By "precision offset" we are referring to stations employing a ± 3 Hz frequency tolerance and "plus," "zero," or "minus" 10,010 Hz offsets. Further, co-channel stations must not use the same offset; that is, if Station A is using a "zero" offset, Station B must use a "minus" or "plus" offset and must *not* use a "zero" offset.



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comments of the American Council on Education, Arizona Board of Regents for Benefit of the University of Arizona, California State University-Sacramento, the Instructional Telecommunications Consortium of the American Association of Community Colleges, Kirkwood Community College, St. Louis Regional Educational and Public Television Commission, South Carolina Educational Television Commission, State of Wisconsin-Educational Communications Board, University of Maine System, University of Wisconsin system and University System of the Ana G. Mendez Educational Foundation ("Educational Parties"), argue for a review of the 28 dB ratio. Hardin suggests 35 dB, WCA suggests 39 dB, and the Educational Parties offer no specific ratio.

3. Because the O&FNPRM did not give notice that the appropriateness of the 28 dB ratio for offset operation would become a matter for discussion, the Commission should take no action on this issue now. If the Commission believes that the appropriateness of the 28 dB ratio is a matter requiring review, an additional FNPRM should be issued, giving all interested parties proper notice that this issue is to be considered. It is unfair to allow consideration of such a fundamental issue to be raised in this instant proceeding, where proper notice of that issue was not given, as required by the Administrative Procedures Act.²

4. In the event the Commission nevertheless considers this aspect of the Hardin, WCAI, and Joint Educator's comments, H&E wishes to respond in support of the 28 dB ratio.³ This relaxed D/U ratio has been accepted for years by the Commission as appropriate for co-channel National Television System Committee (NTSC) 525-line transmissions and is codified in Sections 74.705(d)(1) and 74.707(d)(1) of the Commission's Rules governing TV Translator stations and Low Power Television (LPTV) stations. The only difference between co-channel ITFS stations using NTSC transmissions and co-channel LPTV/Translator stations using NTSC transmissions is

² Indeed, in a recent Rulemaking, MM Docket 93-114, "Review of the Commission's Rules Governing the Low Power Television Service," Commission staff declined to consider several comments considered to be highly pertinent by two respected consulting engineering firms, H&E and du Treil, Lundin & Rackley, Inc. ("dLR"), on the grounds that the comments "raised other issues not addressed in the Notice" (June 2, 1994, Report & Order ("R&O") to Docket 93-114, at Page 13, Footnote 41). It would be inconsistent in the extreme for Commission staff that had taken narrow interpretation of the issues raised in Docket 93-114 now to do a "flip-flop" and allow parties to address an issue fundamental to the design of co-channel ITFS stations, when no public notice was given that the appropriateness of the 28 dB D/U ratio would become a matter for discussion.

³ The Commission's attention is directed to the extensive engineering record developed in Puerto Rico as a result of the WSTE, Channel 7, Ponce, quadruple-transmitter tests (File Nos. BMPEX-880602KG and BLEX-870219KG). These tests involved four co-channel transmitters operating simultaneously with precision frequency offsets, directional antennas, and natural terrain shielding, to bring service to a much greater portion of Puerto Rico than was possible using a conventional, single transmitter (at Cerro Maravilla, the original WSTE transmitter site). Literally thousands of "before" and "after" picture quality and D/U ratio measurements were taken and reported to the Commission in five separate engineering reports between April 1987 and March 1990. Those reports showed that precision offsets allowed approximately 6 dB relaxation of the D/U ratio for a given picture quality.



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that it is more difficult to achieve a ± 1 kHz frequency tolerance at 2.5 GHz ITFS frequencies than it is at VHF and UHF TV frequencies. It is my belief that the sole reason why the ITFS rules did not develop with a specific rule section equivalent to §74.705(d)(1) of the TV Translator rules was because attaining a ± 1 kHz frequency stability at ITFS frequencies was so difficult and expensive. At the time the ITFS rules were developed, the use of frequency offsets was rare. Further, in the early days of ITFS, there was no channel scarcity problem. If another educational entity desired to serve the same or an overlapping area, it was easier simply to select another channel group than to re-use the channel group by employing frequency offsets.

5. To now consider changing the D/U ratio allowed for offset operation would undermine many planned ITFS system upgrades, or planned new ITFS stations, designed on the assumption that an application engineered so as to provide co-channel protected receive sites with at least a 28 dB ratio, on the condition that both stations employ the appropriate frequency offsets. It would be unfair to parties that had taken the Commission at its word that a relaxed D/U ratio of 28 dB would be acceptable, so long as frequency offsets were employed, to now change that standard in “mid-stream.”

6. Hardin argues that the reason a 28 dB D/U ratio is acceptable for TV, TV Translator, and LPTV transmissions but should not be considered as acceptable for ITFS transmissions is because a more rigorous statistical certainty is needed for ITFS service. Or, in other words, interference that is acceptable at, say, 50% of the time at 50% of the locations for TV service, is not acceptable for ITFS service; some higher availability, such as 90% of the time at 90% of the service area, is supposedly needed. However, if this argument is to be accepted, then it follows that the 45 dB ratio required for co-channel ITFS stations with *no* frequency offset must also be inadequate, since the premise of the relaxed D/U ratio allowed for offset operation was that it would provide the same picture quality (*i.e.*, the same amount of co-channel interference) as for two stations operating with no frequency offset. The implications to the existing universe of ITFS stations, most of which employ no frequency offset, is staggering: either those stations must now be re-engineered to some higher D/U ratio, or all such stations must be required to upgrade to offset operation, or the Commission must “grandfather” existing ITFS stations at the 45 dB D/U ratio. None of these options appears reasonable, and would certainly be unfair to existing licensees.

7. Recent informal discussions amongst the parties filing comments to this instant docket have taken place. A compromise technical standard of a 39 dB D/U for co-channel ITFS/MMDS stations employing standard frequency offsets, and a 32 dB D/U ratio for stations employing precision offsets, has been suggested. While we question the need for even this more rigorous standard, it



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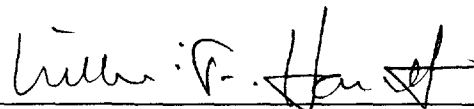
would at least leave the door open for systems designed on the basis of a 28 dB co-channel D/U ratio, which could then be re-engineered to meet a requirement only 4 dB more stringent (albeit at the cost of employing precision offsets rather than standard offsets). In contrast, a 7 dB more stringent requirement (*i.e.*, a 35 dB D/U ratio) or an 11 dB more stringent requirement (*i.e.*, a 39 dB D/U ratio) would effectively preclude channel re-use in congested and naturally terrain-limited markets, such as the San Francisco Bay Area.

II. H&E Supports Making Offset Operation Upgrades Mandatory

8. At least one other party besides H&E, RuralVision Central, Inc./RuralVision South, Inc., urged the Commission to make upgrades to offset operation always mandatory. H&E reiterates its support for this approach, as to do otherwise would give existing ITFS licensees "veto" power by simply declining to upgrade their transmitters in order to avoid competition. In the event the transmitters of an existing ITFS station are of a type that does not already have a frequency stability of ± 1 kHz or better (for standard offsets) or ± 3 Hz or better (for precision offsets), the newcomer station should be allowed, as a matter of right, the option of upgrading the local oscillators of the existing transmitters to the appropriate frequency stability or, if the existing transmitters are so old as to make such upgrade impractical, to supply the existing ITFS licensee with new transmitters capable of maintaining the appropriate frequency tolerance. Only then would the more efficient use of the wireless cable spectrum be limited to an engineering issue; it could not be used as a "front" for a marketing issue, designed to minimize competition.

Respectfully submitted,

Hammett & Edison, Inc.

By 
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September 28 1994

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